

WHAT IS CLAIMED IS:

1. An apparatus for processing a stacked-type connector having terminals connectable to electric wires and arranged parallel with one another in a predetermined direction, and housings each accommodating the arranged terminals and stackable one upon another and connected to each other, each of the terminals having a female connection portion formed at one end thereof in the longitudinal direction thereof and accommodated in the housing, and a joint portion extending from the female connection portion, said apparatus for processing the stacked-type connector comprising:

a pressing unit configured to press the joint portion of the housing into a generally U-shaped configuration; and

a stacking unit configured to sequentially stack the joint portion-pressed housings one upon another in a predetermined order.

2. The apparatus for processing a stacked-type connector according to claim 1, further comprising a correction unit disposed between said pressing unit and said stacking unit, said correction unit configured to correct a configuration of the joint portion shaped by said pressing unit.

3. The apparatus for processing a stacked-type connector according to claim 1, further comprising an electric wire guide unit provided on said stacking unit, said electric wire guide unit configured to guide electric wires of the housings supplied to said stacking unit.

4. The apparatus for processing a stacked-type connector according to claim 1, further comprising a housing supply unit configured to stock the housings in such a way that the housings are suppliable to said pressing unit in a housing-stacking order.

5. The apparatus for processing a stacked-type connector according to claim

4, wherein said housing supply unit is configured to stock the housings in such a way that the housings are suppliable to said pressing unit by removably holding a housing holder unit accommodating the housings of said wire harness in a housing-stacking order.

6. A housing holder unit usable in the apparatus for processing a stacked-type connector according to claim 5, said housing holder unit comprising:

a holder body configured to stock the housings of the stacked-type connectors in a housing-stacking order; and

a protection cap provided for each of the housings held by said holder body and covering joint portions of each of the housings,

wherein said protection cap is connected to said holder body in such a way that said protection cap is removed from the housing by a removal operation of the housings from said holder body.

7. A wire harness supply method for supplying a stacked-type connector and a wire harness to an apparatus, and for processing the stacked-type connector, according to claim 1, said method comprising:

mounting a protection cap configured to cover an unprocessed joint portion on each of the housings at a time of manufacturing the wire harness;

stocking the protection cap-mounted housings in a holder body forming a housing holder unit together with the protection cap in such a way that the housings are suppliable in a housing-stacking order;

mounting the housing holder unit and the stacked-type connector on the wire harness; and

supplying the wire harness and the housing holder unit mounted on the wire harness to said processing apparatus.

8. The apparatus for processing a stacked-type connector according to claim

1, further comprising:

a frame member configured to hold the housing, with the joint portion placed in a predetermined pressing position;

a first pressing portion configured to sandwich a linear joint portion placed in said predetermined pressing position under pressure and to bend a front end of the joint portion;

a second pressing portion configured to bend the joint portion to have a generally U-shaped configuration by folding back a base end of the terminal with respect to the bent joint portion after said first pressing portion bends said front end of said joint portion; and

a driving mechanism configured to sequentially drive said first pressing portion and then said second pressing portion.

9. The apparatus for processing a stacked-type connector according to claim 8, wherein said first pressing portion includes a pair of dies configured to sandwich therebetween all of the joint portions projecting from the connectors placed at said predetermined pressing position of said frame member.

10. The apparatus for processing a stacked-type connector according to claim 9, wherein said frame member includes a guide member configured to guide said pair of dies along a same line.

11. The apparatus for processing a stacked-type connector according to claim 8, wherein said second pressing portion includes a die configured to bend all of said joint portions of the terminals in a space between said die and the housings of the connectors placed at said predetermined pressing position of said frame member.

12. The apparatus for processing a stacked-type connector according to claim 11, wherein said die of said second pressing portion includes a punching portion configured to press all of the joint portions projecting from the connectors.

13. The apparatus for processing a stacked-type connector according to claim 1, further comprising:

a housing-holding portion configured to hold the housings of stacked-type connectors in a stacking order;

a correction mechanism that corrects a configuration of the joint portion projecting from one of the housings held by the housing-holding portion and connectable to the female connection portion of another of the housings to be stacked on the one housing held by said housing-holding portion, said correction mechanism being movable between a correction position where the joint portion is corrected and a position away from the joint portion that allows the joint portion to be connected to the female connection corresponding thereto; and

a fit-in mechanism that temporarily fits the another of the housings to the one housing after the configuration of the joint portion of the one housing after the configuration of the joint portion of the one housing is corrected by said joint portion correction mechanism and normally fitting both housings to each other after said correction mechanism moves away from said joint portion correction position.

14. The apparatus for processing a stacked-type connector according to claim 13, wherein said correction mechanism includes a position regulation member configured to receive a lower surface of a free end of the joint portion of the one housing positioned in said housing-holding portion; and

a correction member configured to an upper surface of the free end of the joint portion downward, with the joint portion sandwiched between said correction member and said position regulation member.

15. The apparatus for processing a stacked-type connector according to claim 13, further comprising a locking mechanism configured to move between a locking condition in which one of the housings initially placed in the housing-holding portion

is locked to the housing-holding portion and an unlocking condition.

16. The apparatus for processing a stacked-type connector according to claim 15, wherein said locking mechanism comprises:

a sliding member configured to move between a housing-locking position and a housing-unlocking position; and

a connection member connected to said sliding member so that said sliding member is movable from said housing-unlocking position to said housing-locking position in unison with a fit-in operation of said fit-in mechanism.

17. The apparatus for processing a stacked-type connector according to claim 16, further comprising a holding mechanism configured to hold said sliding member at said locking position, and wherein said connection member connects said sliding member and said fit-in mechanism to each other so that said fit-in mechanism moves relative to said sliding member located at said locking position to perform an operation of fitting the housings together.

18. A wire harness having a stacked-type connector having at least one terminal with a male portion extending therefrom and shaped to have a generally U-shaped configuration connectable to a female connection portion of another terminal of an adjacent connector, said stacked-type connector being formed by the apparatus of claim 1.

19. A method for stacking housings of stacked-type connectors each having terminals arranged parallel with one another in a predetermined direction, and housings accommodating the arranged terminals and stacked one upon another in a direction perpendicular to the direction in which the terminals are arranged and connected to each other,

each of the terminals having an electric wire connection portion formed at one end thereof in a longitudinal direction thereof and connected to an end of a coated

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electric wire, a female connection portion formed at the other end thereof in the longitudinal direction thereof and accommodated in the housing, and a joint portion extending from the female connection portion, with a front end of the joint portion formed to have a generally U-shaped configuration and connectable to the female connection portion of another of the terminals adjacent to the one of the terminals in a direction in which the housings are stacked one upon another;

said method comprising:

holding the housings of stacked-type connectors in a stacking order;

correcting, with a correction mechanism, a configuration of the joint portion projecting from one of the housings held by the housing-holding portion and connectable to the female connection portion of another of the housings to be stacked on the one housing held by the housing-holding portion; and

fitting the another housing to the one housing after the configuration of the joint portion of the one housing is corrected by the correction mechanism.

20. The method according to claim 19, wherein said correcting is performed with a correction mechanism comprising a plate-shaped member.